

STATE OF DELAWARE
SINGLE POINT OF CONTACT – SPOC
INTERGOVERNMENTAL REVIEW OF FEDERAL PROGRAMS
Office of Management and Budget
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1. STATE APPLICATION IDENTIFIER:

10-04-23-01

SPOC use ONLY

Month

Reviewer

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2. Applicant Project Title: ARRA ELC Infrastructures and Interoperability Support for the Public Health Laboratories

3. Applicant Department: Delaware Health and Social Services

4. Applicant Division/APU: Division of Public Health-DE Public Health Laboratory 05

5. Applicant Address: 30 Sunnyside Road, Smyrna, DE 19977

6. Contact Person: Jane P. Getchell, DrPH

7. Contact Person's Phone Number: 302-223-1520

8. Signature of Secretary or Agency Head (for state agencies) or Chief Administrator (for all other applicants)

Karyl T. Rattay, MD, MS, FAAP, FACPM, Director, Division of Public Health, designee for Rita M. Landgraf, Secretary, DHSS

04/20/10

9. Federal Grantor Department: Health and Human Services

10. Federal Sub-Agency: Centers for Disease Control and Prevention

11. Federal Contact Person: De'Lisa Simpson

12. Phone Number: 770-488-2905

13. Address: CDC/Procurement & Grants Office, MS E-14, 2920 Brandywine Rd., Atlanta, GA 30341

14. Federal Program Title:

Centers for Disease Control and Prevention

15. FEDERAL CATALOG NO:
(CFDA)

93

729

N

16. Project Description:

The American Recovery and Reinvestment Act of 2009 (ARRA) includes the Health Information Technology for Economic and Clinical Health Act of 2009 (the HITECH Act) that sets forth a plan for advancing the appropriate use of health information technology to improve quality of care and establish a foundation for health care reform. The public focused activities being advanced under ARRA cover activities intended to carry out HHS responsibilities to support meaningful use of electronic health record through two-way communications between clinicians, and national, state, and local public health entities.

This grant will establish the ability to share information among various public health programs through data exchange between public health partners via an existing Health Information Exchange (HIE) which will support the surveillance, analysis, and decision-making processes concerned with the health of Delaware's population. Existing applications with overlapping functionality will be consolidated and standards-based data interfaces will be developed in order to establish an integrated information technology architecture.

17. Will funds be utilized for any technology initiatives? ☒ Yes ☐ No If so, Business Case Number and brief project summary:

This project will require the time of contract programmers, an information support specialist and a laboratory LIMS administrator. We are requesting 2 computers necessary to achieve systems interoperability and electronic submission of reportable lab results. The development of interoperable systems will enable information flow among Electronic Health Records, hospital labs and public health agencies. A Business Case has been submitted #20071329_01_01. This business case will be updated to include technical information when funding has been secured.

18. Measurable Objectives:

a. What were last year's objectives?
N/A

Were these objectives met? (If not, please explain why)

N/A

c. What are this year's objectives?

1. Update the laboratory LIMS to meet Public Health Information Network (PHIN) and National Health Information Network (NHIN) standards.
2. LIMS will receive test orders and send certified messages to a Health Information Exchange (HIE) on a regular basis.

5/7/10

19. Grant Period: From: 05/31/2010 To: 05/30/2012	20. How many years has this project been funded: 0	21. If the project was funded last year, how much federal money was awarded? N/A
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22. Source of funding for this application:	Dollars
a. Federal grant	\$598,895
b. Other federal funds (Specify source of funding)	
c. Required state contribution (Specify source of funding)	
d. Discretionary state contribution (Specify source of funding)	
e. Required local contribution (Specify source of funding)	
f. Other non- federal funds (Specify source of funding)	
TOTAL	\$598,895

23. Budget by cost category and source:	Federal Funds	State Funds	Other Funds	Total Funds
Salaries & Fringe Benefits				
Personal or Contractual Services	\$592,000			\$592,000
Travel	0			0
Supplies & Materials	\$700			\$700
Equipment	\$5,000			\$5,000
Audit Fees	\$1,195			\$1,195
Indirect Costs				
Other				
TOTAL	\$598,895			\$598,895

24. How many positions are required for the project? (Exclude casual/seasonal employees)			
Breakdown of position(s)	Authorized in State Budget	New Positions Required	Total
Paid for out of federal funds	0	0	0
Paid for out of General Funds			
Paid for out of state special funds			
Paid for out of bond/local/other funds			
TOTAL	0	0	0

DIRECTOR'S OVERVIEW

1. Program Narrative

The American Recovery and Reinvestment Act of 2009 (ARRA) includes the Health Information Technology for Economic and Clinical Health Act of 2009 (the HITECH Act) that sets forth a plan for advancing the appropriate use of health information technology to improve quality of care and establish a foundation for health care reform. This ARRA project will support meaningful use of electronic health records through two-way communications between clinicians, and national and state health entities.

Two-way communication between the Laboratory Information Management System (LIMS) and public health partners will be established by updating LIMS to meet Public Health Information Network (PHIN) and National Health Information Network (NHIN) standards. LIMS will be able to receive test orders and to send Public Health Information Network (PHIN) certified messages to a Health Information Exchange (HIE) on a regular basis. Share information among various public health programs through data exchange between public health partners via an existing Health Information Exchange (HIE) will support the surveillance, analysis, and decision-making processes concerned with the health of Delaware's population. Existing applications with overlapping functionality will be consolidated and standards-based data interfaces will be developed in order to establish an integrated information technology architecture.

2. Budget Comparison

\$598,895 is being requested covering a two year period beginning June 1, 2010. This project will require the time of 2 contract programmers, an existing information support specialist and an existing laboratory LIMS administrator. We are requesting 2 computers necessary to achieve systems interoperability and electronic submission of reportable lab results. Support of the current LIMS vendor will also be needed. A Business Case has been submitted #20071329_01_01. This business case will be updated to include technical information when funding has been secured.

3. Relationship to State Budget

No state match is required

Infrastructure and Interoperability Support for Public Health Laboratories

Abstract

The strategic IT vision for the Delaware Division of Public Health (DPH) is to support a client-centric interoperable public health data system and to integrate information collected by all the DPH programs. The main goals are to share information between various public health programs including the Delaware Public Health Laboratory (DPHL) Laboratory Information System (LIMS), through data exchange among public health partners via a Health Information Exchange (HIE). Public Health Information Network (PHIN) and National Health Information Network (NHIN) standards must also be met. To accomplish this LIMS must be updated and interfaced with an integration engine so that mapped HL7 messages can be sent from LIMS to agency partners, hospitals and community health centers. The consolidation of existing applications with overlapping functionality, and the development of standards-based data interfaces are necessary to systematically move towards integrated information technology architecture.

Narrative

Background, Need and Understanding

DPHL current Laboratory Information Management System (LIMS) (developed by LabWare™, Inc. of Wilmington, Delaware) was fully implemented by June 2006. It includes both clinical and environmental aspects of our Public Health Laboratory that provide various public health agencies and health care providers with test result information vital to the health of the citizens of Delaware. LIMS does not currently send HL7 messages. All of DPHL partners receive laboratory information either from an actual LIMS session or via mailed reports. The exception to this is the Delaware Electronic Reporting and Surveillance System (DERSS) which accesses lab data from a queried view provided by LIMS.

The electronic exchange of health information data is being developed on several different fronts within the state, including the construction of the Delaware Health Information Network (DHIN). DHIN is a public-private partnership, which provides the organizational infrastructure to support a clinical health information exchange across the State of Delaware. DHIN is a collaboration of physicians, hospitals, commercial laboratories, community organizations and patients, designed to provide for the secure, fast and reliable exchange of health information among the many medical providers treating patients in Delaware.

The update of our Laboratory Information Management System (LIMS) to include a PHIN certified HL7 format electronic data exchange functionality would enable the use of the State of Delaware's communication infrastructure to interface with state public health partners, including hospitals, community health organizations, the Centers for Disease Control and Prevention (CDC), and other states' laboratory information management systems. This requires no software purchase, but only contract time to accomplish the necessary programming changes. Outside of LIMS, a module to hold all state medical provider demographic information is needed to meet the message requirements desired by the various public health partners. Currently this piece is missing from data being sent to DHIN. This also requires contract programming time.

Interfaces will need to be constructed between LIMS and hospital Electronic Health Record (EHR) systems to allow direct ordering and receipt of laboratory tests and results to meet the objective of data exchange between hospitals and DPHL, and hospitals and public health

agencies. Interfaces are also needed between LIMS and the proposed state clinic EHR system, and other in-state and out-of-state public health agencies.

The state of Delaware is committed to the electronic exchange of health information. Nine million dollars has already been invested in the development of our Delaware Health Information Network (DHIN). A manager from the Public Health Information Management System office is a member of the DHIN board of directors. Several of the local hospitals and commercial reference labs currently send data to DHIN. Local community health agencies that possess electronic medical records are also beginning to send data to DHIN. As moneys have come available, the infrastructure has been laid to move this project forward. A server has been purchased to house the installed PHIN Messaging System (PHINMS), Messaging Subscription Service (MSS), and Rhapsody software products.

Current Activities/Capacities/Previous Experience

The largest project within the state, and currently ongoing, is the Delaware Health Information Network (DHIN). This repository receives information from various health partners to be sent on to public health agencies and CDC. Other projects include Electronic Vital Records System (EVRS) which has been successfully implemented and provides electronic data transfer to such programs as Child Support Services, and vital record statistics to numerous other DPH sections.

PHIN Certification was recently obtained by DPH Information Management Services (IMS) for TB and Varicella HL7 messages. Rhapsody was purchased and installed on a new server purchased solely for HL7 messaging. Our state clinics are currently investigating various Electronic Medical Record systems, which will eventually be interfaced with DHIN to send patient information. The expectation is to also interface with LIMS, enabling not only the receipt of results by the clinic but also the sending of test requests, via HL7 messaging. Working with a contractor provided by the FDA, eLEXNET was recently installed to send food sample results to the FDA, and DPHL is also an active member in LRN.

Currently, DPHL LIMS is installed in both the clinical and environmental sections of the lab. The system was developed and installed over the course of 20 months and has been live for 5 years. The system was developed with the most up-to-date National Lab standards in place at that time. Current installation of LIMS is compliant with CPT, SNOMED, LOINC, and SDWIS (EPA Drinking water) codes. CPT codes are updated by the system administrator as notification of changes is received. However, other national laboratory standards are not currently utilized.

DPHL LIMS was implemented shortly after the laboratory business processes were developed by the Association of Public Health Laboratories (APHL) and the Public Health Informatics Institute (PHII). Most processes are installed in LIMS:

- LIMS electronically receives both clinical and environmental test requests from and electronically delivers results to almost every partner state agency, community partner, hospital, and school-based wellness center in the State via live secure access to LIMS.(BP1)
- Each sample is assigned a unique identifier which follows the sample for its entirety. Tests are batched, assigned to instruments/benches depending on the test requested. Special samples can be easily identified and prioritized based on this system. Additional tests can be added based on the results obtained/entered on the original sample (BP2, 3).

- All aspects of the sample are captured as it travels thru the lab from time of creation/login to date of final report. Any change made to the sample is time/date stamped with the name of the person who made the change/entry. (BP4)
- All data pertaining to controls and QCs is also captured and is discernable from a regular sample. LIMS also has an inventory system that allows tracking of lot number, expiration dates, in-use dates, vendors, reagents, controls, kits, and media. The system can be queried to track inventory by test or reagent and produce a report detailing what reagents are due for QC testing (BP5, 6).
- When testing is complete and samples have completed the three-level review process, the results are available for viewing or printing by our partners who have live access. Sample reports are printed and mailed daily for those partners who do not have live LIMS access, usually private physicians. Other report processes include unreceived sample tracking, cancelled sample reports, statistical reports for specific tests or test categories and surveillance purposes, internal workload reports, QC reports, CDC sexually transmitted disease (STD) reports, and billing reports. CDC report is viewed by our STD program partners and the billing report is sent to our billing administration office (BP7, 8, 9). A condensed sample flow diagram is displayed in the appendix.
- Any business partner who would like access to LIMS signs a Memorandum of Understanding for a defined term, usually as long as the business contract with that partner. Training for their staff on the use and management of LIMS as it applies to their agency is conducted by the LIMS administrator or designee. A train-the-trainer philosophy is strongly encouraged due to the wide variety of office work flows at each of the partner agencies. Training is offered at suitable locations in the state several times a year and willingly conducted on-demand for larger staff audiences of new partners. Refresher training sessions are also held as changes occur to LIMS. (BP10, 11)
- The QA officer is responsible for review of not only the quality of the tests performed in the lab but also customer service with our partners. DPHL provides test kits and supplies, courier delivery and pick-up, technical expertise, and training to state clinics, community health organizations, and school-based wellness centers. Lab certifications and customer concerns are tracked and managed by the QA Officer who also provides Biosafety/Biosecurity training and follow-up of any accidents occurring on/in lab property (BP 12, 13, 14, 15).
- The implementation of an updated LIMS will allow for faster transport and easier translation of data to both in-state and out-of-state partner agencies. These necessary changes to LIMS will also facilitate the establishment of partnerships with other state laboratories for the development of cooperative agreements, disaster recovery, and surge capacity plans in response to local, regional or national emergencies (BP 16).

As mentioned above, the state of Delaware is committed to the electronic exchange of health information. Steps have already been taken to build the infrastructure needed for this project.

- A LIMS has been successfully installed and operational for 5 years.

- The Delaware Health Information Network (DHIN) has been established and participating partners are sending and receiving information.
- In anticipation of HL7 message transport, Rhapsody has been purchased as our integration engine and a new server was obtained. This server will house the integration engine, and corresponding software PHIN MS and MSS. This will enable the routing and distribution of data between applications and services within and outside of the State.
- TB and varicella messages have been constructed and PHIN certified.
- Data extracts from LIMS can be done by SQL-type queries and the data can be exported electronically in a variety of formats (pdf, xls, txt, csv), to be manipulated as needed.
- LIMS currently has data fields in place providing CPT, SNOMED, and LOINC codes.

See appendix for Information Process Flow Chart

Needs are as follows:

- Updating LIMS to provide the most current language standards and the ability to send HL7 messages.
- A state-wide provider demographic interface to supply clinical provider information. Updating LIMS will include a module that houses both provider and submitting agency data.
- An interface between LIMS and Rhapsody, as well as between LIMS and other in-state public health agencies.
- An interface between LIMS and hospital EHR systems.
- An interface between LIMS and out-of-state public agencies.

Delaware has a list of authorized contract programming/IT companies that can quickly be engaged for a project without the delays of a bidding process. The LIMS vendor is the sole source for the DPHL LIMS and as such is intimately familiar with the existing system. Therefore, the vendor is better able to quickly analyze the gaps in the current LIMS and implement the necessary changes. The vendor also participated successfully in the CDC/APHL Public Health Interoperability Project (PHLIP) and can lend that knowledge and experience to this project by applying working solutions to DPHL LIMS.

Operational Plan

Necessary changes to LIMS to include electronic data exchange functionality are the first steps towards data exchange interoperability. This will securely send laboratory data and patient demographic information in HL7 format. This system will ensure secure real-time exchange of electronic information to enhance preparedness for early detection, awareness, rapid reporting and response to threats to the health of the citizens of Delaware. It will do this by:

1. Decreasing the time required to exchange data between healthcare providers and DPHL (improve turn-around time), and DPHL and public health agencies.
2. Increasing the efficiency of data exchange between state and national health entities during an epidemic or disaster situation when surge capacity is required.
3. Provide consistency, efficiency, and accuracy of reports by reducing duplication of data entry and data manipulation.

The activities involved in the accomplishment of these goals include:

- A gap analysis of the current LIMS to prepare for efficient HL7 messaging
- Develop a work plan based on the gap analysis for LIMS
- Implement a timeline with achievable milestones
- Partner with state public health agencies currently sending information to DHIN
- Contract with LIMS vendor to modify the current LIMS system
- Implement current PHLIP influenza messaging guide and participate in user group activities
- Hire contract IT staff to begin building state-wide provider/submitter data module and to aid in the construction of HL7 messages
- Participate with other grant awardees in information sharing pertaining to data exchange between EHR systems and public health agencies.
- Seek information from other states that are successfully sending HL7 messages via EHRs.
- Partner with hospitals to interface their EHRs with LIMS.
- Seek technical solutions and guidance from Laboratory Interoperability Solutions and Solution Architecture (LTISSA)
- Create a plan for future interfaces with agencies not currently HL7 capable.

The interface between DPHL LIMS and Rhapsody is expected to move quickly as the LIMS vendor has previous experience mapping HL7 messages due to their work with Florida on PHLIP. With this experience, along with Delaware's current HL7 mapping project of creating a generic HL7 certified message, it is anticipated that the first message to be sent from LIMS will be an influenza result or possibly the already PHIN certified TB message.

Once the update is in place and a message has been successfully sent to Rhapsody in the PHIN certified format and received by the appropriate designated partner, data exchange will be established and allow information flow among various public health partners within the state. This will become the infrastructure for other systems, such as Electronic Health Records (EHRs), Electronic Vital Records System (EVRS), the Immunization program, the HIV program, the Healthy Houses Lead Poison Surveillance System (HHLPPS), and the Cancer Registry. Interfacing with hospital EHRs will follow once HL7 communication has been established between DPHL LIMS and state public health agencies.

The ability to have a bi-directional flow of information will be the final step. Laboratory partners, both state agencies and non-state agency entities such as hospitals and community health centers, will be able to enter test requests from their systems which will be delivered to LIMS, and receive results back the same way through the integration engine. Whether in-state or out-of-state, partners will be maximizing resources, standardizing information, reducing duplication of information and data entry errors, and providing consistency and up-to-date patient health information. With this accomplishment, a roadmap will be created for the information technology infrastructure that will support Delaware Public Health and its partners now and into the future.

Below is the proposed timeline:

May 31, 2010 – funds awarded

June 2010

- Schedule LIMS vendor to begin system gap analysis (2 weeks)
- Begin procurement process for hardware necessary for LIMS upgrade

- Sign up for APHL user groups to discuss project
- July 2010
 - Schedule LIMS vendor to begin system update
- August 2010
 - Begin LIMS update
 - Complete generic HL7 message
- September 2010
 - Contract programmer hired
 - Contract programmer begins building state-wide provider module
- December 2010
 - LIMS update completed
- January 2011
 - Begin LIMS-Rhapsody interface
- February 2011
 - Complete state-wide provider module
- May 2011
 - LIMS-Rhapsody interface complete
 - HL7 message sent to and received by internal partner – DERSS or DHIN (to be decided)
- June 2011
 - Submit Annual ELC Interim Progress Report to CDC
- December 2011
 - HL7 message sent to other Public Health agency
- January 2012
 - Reportable Results sent in HL7 format to hospital partner
- May 2012
 - Reportable results sent in HL7 format to internal (state agency) partners on regular basis
 - HL7 message sent and received by out-of-state partner
- August 31, 2012
 - Final Program and Financial reports submitted to CDC

Staff and Responsibilities

The management of this project will be shared between DPH Support Services IT and DPHL Administration.

The Chief of Information Management Services, Support Services Section will be the liaison for issues related to Information Management Resources (IRM) and Delaware Department of Information Technology (DTI) policies, as well as liaison to the Delaware Health Information Network (DHIN).

The Information Support Services Specialist (ISSS) is the PHIN and HAN coordinator, and the liaison for issues related to the Delaware Electronic Reporting and Surveillance System (DERSS) and internal public health agency partners such as the Immunization program as well as the CDC. The ISSS will also be in charge of the contract programmers for the Rhapsody interfaces. The ISSS reports to the Chief of Information Management Services, Support Services Section.

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The LIMS administrator will coordinate the LIMS vendor contractor and any issues related to non-state partners, such as hospitals, community health organizations, and school-based wellness centers. The LIMS administrator reports to the DPHL Director and the ISSS. Note diagram next page:

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The assigned ISSS will be responsible for the following:

- Procurement of servers and computers
- Data exchange coordinator
- IRM programmer time
- Contract vendors for Rhapsody interface
- Progress reports on milestones pertaining to above

The LIMS administrator will be responsible for the following:

- Contract with LIMS vendor
- Scheduling of LIMS consultant(s)
- Liaison with DPHL partners for HL7 messaging
- Progress reports on milestones pertaining to LIMS and HL7 message development
- Filing progress reports monthly to CDC

Currently, IRM has one HL7-capable programmer on staff in a full time position and DPHL has one full-time LIMS administrator. Personnel for this project will include procurement of vendor contractors to accomplish LIMS changes, HL7 message development, and establishment of communication between DPHL, HIE entities (DHIN and DERSS), and partner agencies. A laboratory vocabulary specialist may be contracted to assist in message development.

The LIMS contract consultant will be responsible for the following:

- Installation of the LIMS update
- Implementation of PHLIP messaging guide
- Mapping HL7 messages from LIMS to Rhapsody
- Progress reports pertaining to the above

The contract programmers will be responsible for the following:

- Creation of state-wide provider demographics module
- Creation of HL7 certified message formats
- Interface partner agencies with Rhapsody
- Progress reports pertaining to the above

Performance Measures and Evaluation Plan

Due to the monthly reporting schedule for this grant, evaluation of progress will be consistent and milestones specifically defined. Monthly progress reports will be made not only by the LIMS administrator but also by the ISSS. Contractors will be given target goals based on reasonable expectations of the project scope. Performance will be measured by the accomplishment of these goals, set as milestones below. Any issues arising during the project will be reported immediately to the appropriate person, i.e. if it is an IMS issue it will be reported to the ISSS; if it is a LIMS issue it will be reported to the LIMS Administrator. Any problems outside of these expertise areas will be reported to the CDC project staff for consultation.

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Evaluation will be based on the timeliness of goal achievement, and success of message mapping and transmission for each agency. Once communication has been established with one partner, the subsequent interface of other partners will follow based on this established infrastructure.

Milestones

- Funds awarded
- Schedule LIMS vendor to begin system gap analysis; estimate for completion is 2 weeks.
- Schedule LIMS vendor to begin update; estimate for completion is 12 weeks.
- Procure any hardware needed for successful completion of this project, i.e., computers.
- Hire contract positions for programming and interface
- Begin construction of provider/submitter module
- Interface LIMS and Rhapsody integration engine
- Complete PHIN certified generic HL7 message
- Send PHIN certified message to Rhapsody, i.e. TB or influenza by the end of the first 12 month post award period.
- LIMS message is received by internal (state) HIE partner (DERSS or DHIN)
- Send all influenza results on a regular basis via HL7 messages to Rhapsody integration engine by the end of 24month grant period.
- Send LIMS HL7 message to non-state agency partner, i.e. hospital or community based health center
- Send LIMS message to out-of-state partner, i.e. Florida PHL or CDC
- Send test request to partner state to demonstrate interstate interoperability
- Receive test request from partner state
- Complete all monthly progress reports in timely manner
- Submit quarterly reports to Recovery.com
- Complete CDC formal evaluations and annual ELC Interim reports
- Participate in PHLIP monthly calls.

Budget

Funds are needed to hire contract personnel to make the necessary changes to LIMS for HL7 message development, and establish communications between DPHL, HIE entities (DHIN and DERSS), and partner agencies (state agencies, non-state agencies, and out-of-state agencies). The majority of funds will be spent on personnel/contract time. There will be no software purchase.

The State of Delaware complies with all American Recovery and Reinvestment Act requirements and regulations of separately tracking and monitoring ARRA funds. To that extent, each ARRA grant is given its own unique appropriation number by the Division's fiscal office in order to track the funds separately and apart not only from other ARRA grants but also non-ARRA grants. In addition, since this Grant is subject to Executive Order 12372, the State's Single Point of Contact, the State Clearinghouse Committee also gives each new ARRA grant a separate and unique identifying number which distinguishes it from other ARRA and non-ARRA grants.

Funds will be spent as follows:

Office Supplies **\$700.00**

Office supplies are required to support daily operations and completing tasks to reach the goals of the grant.

Equipment: **\$5000.00**

Computers are required for daily LIMS operation.

Travel and Training: **\$ 0.00**

No funds are requested for the 2010-2012 grant period.

Contractual: **\$592,000.00**

Funds are requested for contractors to perform LIMS modifications to support HL7 mapping and integration engine interface, electronic laboratory reporting and PHLIP laboratory data exchange. Funds will also be used for software maintenance agreements and fleet charges for instate travel.

Audit Fee: **\$1,195.00**

Total Grant: **\$ 598,895.00**